Proposed Krakeel River Out fall Sewer Pond. Etc

GROUNDWATER RESOURCE INFORMATION PROJECT
EASTERN CAPE PROVINCE

GROUNDWATER INFORMATION SOURCE REFERENCE SHEET

SOURCE REF NR:	KV103	Own Archive	X	Copy attached	X
		Sourced		Copy at source	

A: SOURCE DESCRIPTION

District Municipality:

Amatole		Chris Hani		O.R Tambo	
Ukhahlamba		Cacadu	X	Alfred Nzo	

Local Municipality: KOU - KAMMA

Institution where Information is held: KHULANI VSA GROUNDWATER CONSULTANTS

Branch of Institution: DEPARTMENT OF GEOHYDROLOGY

Contact details:

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B: TYPE OF INFORMATION

Information format:

Hard copy	X	Data Summary	X	Electronic Report	X
Specify Other:					

Report / Info Title: PROPOSED KRAKEEL RIVER OUTFALL SEWER POND

Report Nr: TR/KVSA/EC/342/03 1-Nov-03

Author Details: E. GOOSSENS

Author's Qualification:

Hydrogeologist	x	Govt Dept		Project Manager	
Engineer		Technician		Other	
Specify Other:					

Captured by: NOMSA NKOMO Date: 18-Mar-04 Signed:

C: GEOHYDROLOGICAL CATEGORIZATION

Project Type

Source development		Feasibility Study		Sanitation Study:	
Specify Other: GEOTECHNICAL INVESTIGATION					

Reference Co-ordinate:

Latitude	Longitude
S 33.8138889	E 23.7405556

	Yes	No	Complete	Incomplete
Lithological & Construction Logs		X		
Hydrocensus Data	X		X	
Pump Testing Data		X		
Chemical Water Analysis Data	X		X	
Geohydrological Data	X		X	
Spring Data		X		
Remote Sensing Data		X		
Map Data	X		X	

Comments:

Reviewed by: EUNICE GOOSSENS Date: 25/3/2004 Signed:

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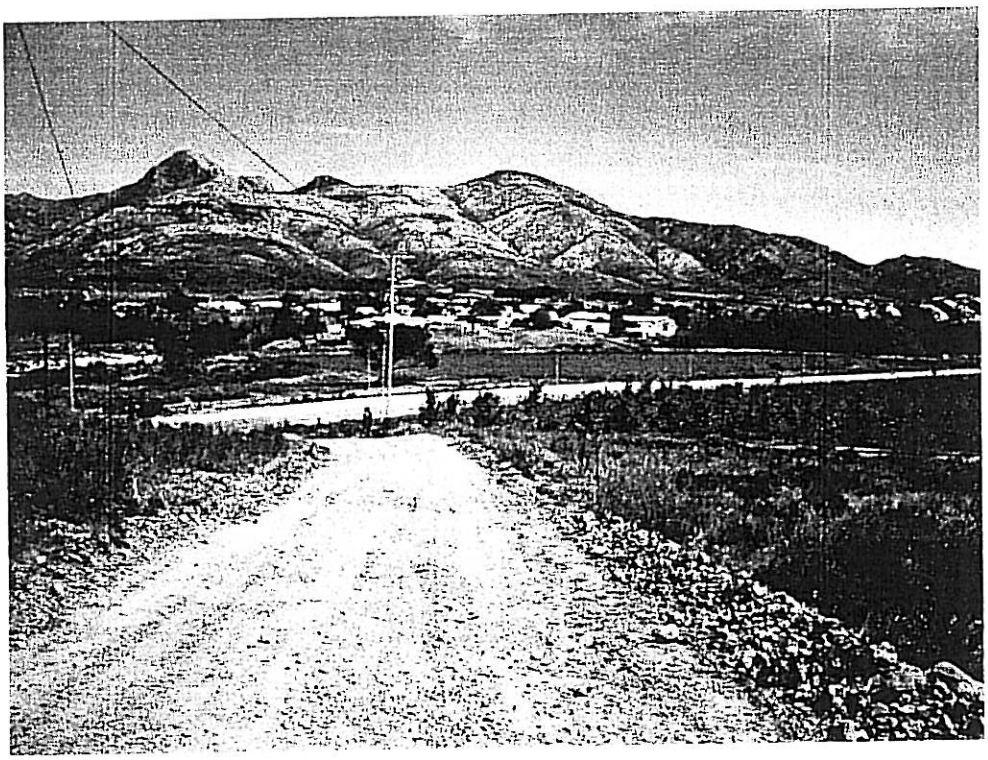
CACADU DISTRICT MUNICIPALITY
KOU-KAMMA LOCAL MUNICIPALITY

PROPOSED KRAKEEL RIVER OUTFALL SEWER POND – GEOTECHNICAL INVESTIGATION



Prepared by: E Goossens

Report nr: TR/KVSA/EC/342/03

Date: November 2003

For: G Cummings

Stemele Bosch Africa

PO Box 27158, Green Acres

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1. INTRODUCTION

Stemela Bosch Africa (Pty) Ltd requested Khulani VSA Groundwater Consultants to perform a geotechnical investigation within the Krakeel Outfall Sewer area. All existing boreholes and springs were to be investigated and sampled. Civil Engineering Materials Laboratory LABCO JOINT VENTURE was appointed to undertake a materials investigation on a two kilometer area. The investigation was undertaken according to the requirements for geotechnical investigations to assess the suitability for the proposed waste disposal site. The following aspects are addressed in this report:

- Geohydrology
- Geology and soil profile
- Geotechnical considerations that might influence the proposed development

2. AREA OF INVESTIGATION

Krakeel River is situated approximately 12 km west of Joubertina on the R62 road within the Kou-Kamma Local Municipality and in the Cacadu District Municipality. The proposed site is about 1 km north-east of the town. ***(Refer to Appendix A: Locality Map)***

3. TOPOGRAPHY AND DRAINAGE

Krakeel River is characterized by its relative flat area (±560mamsl) with the Middelberg Mountains on the Southern side of the R62 (±700mamsl) ***(Refer to Photo 1)***. This mountain range, is part of a regional syncline that was formed during the break-up of the Gondwanaland about 100 million years ago.

The quaternary surface drainage region for this area is L82D. Drainage takes place towards the Krakeel river running through the town, and from there in an easterly direction.

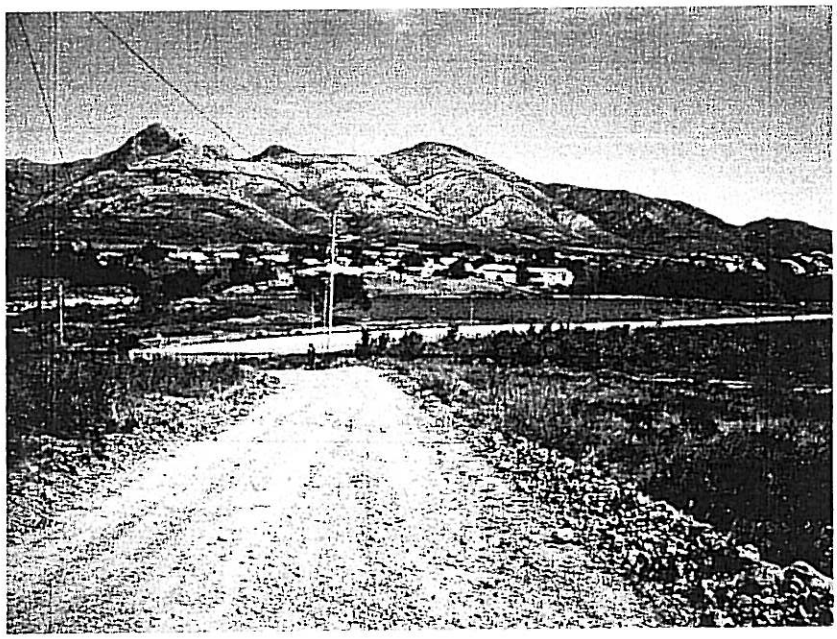

Photo 1: Krakeel River Topography (From North to South). The Middelberg mountain can be seen in the background.

4. METHOD OF INVESTIGATION

4.1. HYDROCENSUS

A hydrocensus was carried out within a 2 km radius of the proposed site during October 2003. No existing boreholes or springs were found within this area, thus no groundwater usage takes place. There is no representative information available for the groundwater such as borehole yields, water levels or chemistry.

There is an existing dam close to the proposed site, fortunately the dam is up gradient from the site ***(Refer to Photo 2)***.

4.2. GROUNDWATER FLOW DIRECTION

The general groundwater flow is towards the main river (Krakeel River) running through the town. Groundwater flows from the north and the south towards the Krakeel River and from there in an easterly direction.

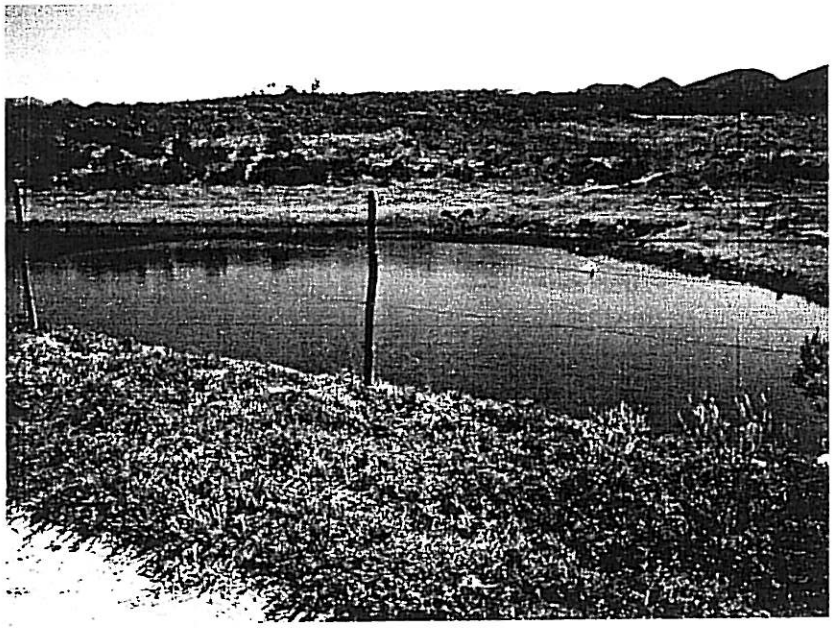

Photo 2: Dam situated up gradient (to the north) from the proposed waste disposal pond

4.3. TEST PITS

Eleven test pits were dug at predetermined position on the position of the proposed sewer outfall pipe line and pond. Three test pits were excavated along the proposed pipe line at intervals of approximately 500m, two test pits at the pump station and six test pits at the sewer ponds site. Each test pit was profiled and the different horizons sampled. (Testing was done as prescribed in ***TMH 1 Standard Methods of Testing Road Construction Materials, Methods A1(a), A2, A2 and A5***.)

(Refer to Photo 4 and Appendix A: Locality Map)

5. GEOLOGY AND SOIL PROFILE

5.1. GEOLOGY

The study area is underlain by shale to the north of the main road R62, and sandstone to the south. The shale forms part of the Gydo Formation of the Ceres Subgroup and the sandstone is part of the Baviaanskloof Formation of the Table Mountain Group.

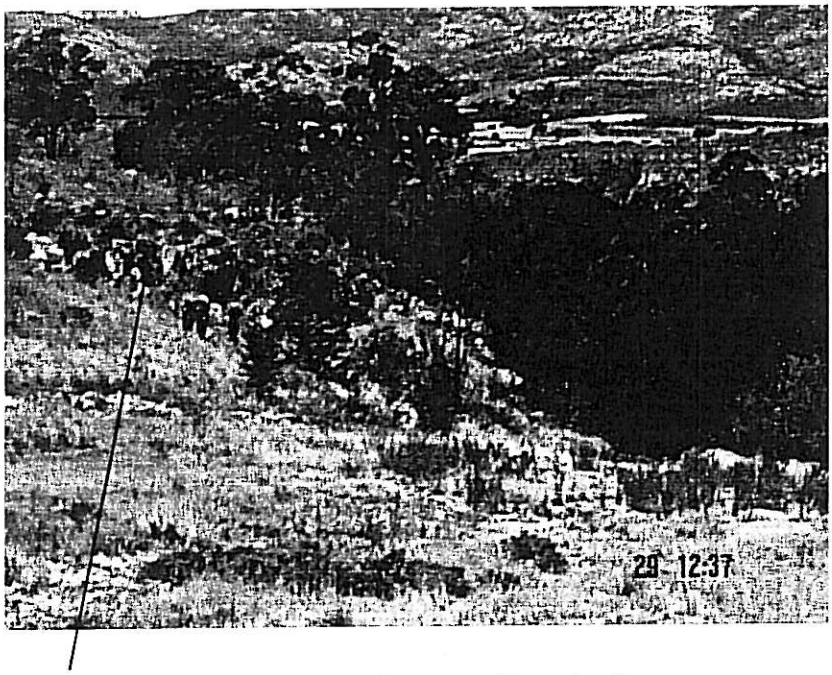

Photo 3: Sandstone Outcrops Close to the study area

5.2. SOIL PROFILE (PERMEABILITY)

The Cape Supergroup bedrock was highly weathered with 2.5 m of scree consisting of boulders, sand and a 20cm soil profile. Refer to photograph. The bedrock is highly fractured and as such is considered a good aquifer and is often targeted in groundwater exploration. Transmissivities within the sandstone can exceed 3m/h. The formation and weathered overburden can be regarded as highly permeable.

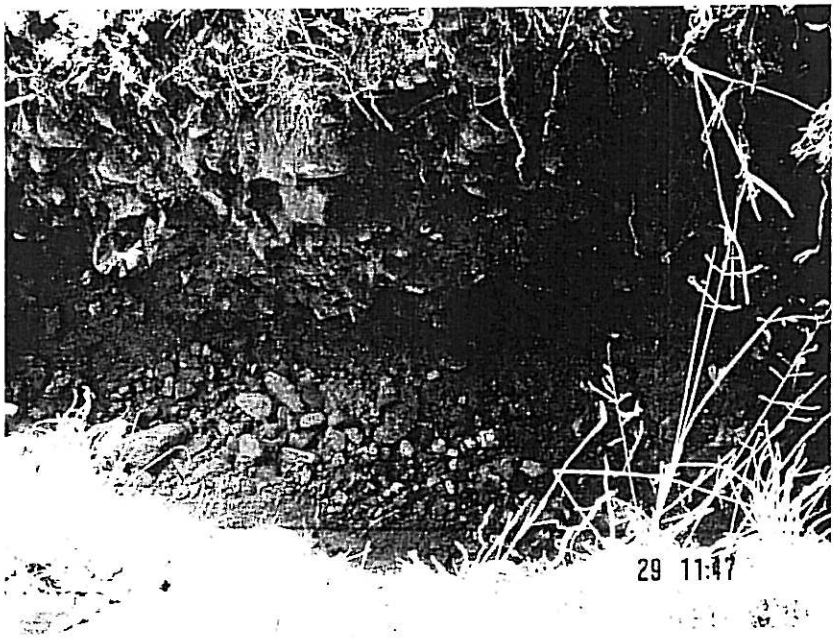

Photo 4: Soil profile – scree consisting of boulders (Test pit)

6. RECOMMENDATIONS

The overburden or scree and underlying sandstone are considered permeable and are unsuitable for establishment of unlined oxidation ponds. Furthermore the sandstone aquifer should be protected from pollutants generated within the sewerage plant area. The immediate risk to water resources both surface and ground is minimal given the groundwater flow direction and hydrocensus discussed above. However cognisance should be taken of any future groundwater developments and as such a piezometer (monitoring borehole) should be drilled down gradient of the proposed site to a depth not exceeding 12m.

In summary:

- The risk to present water resources is minimal,
- The formation is highly permeable,
- The oxidation plants need to lined,
- Consideration should be given to a monitoring piezometer.

REFERENCES

1. Labco Joint Venture, October 2003, Krakeel Outfall Sewer
   "Report on Materials Investigation of Proprosed Outfall".
2. Khulani VSA Groundwater Consultants, October 2001,
   "Report on the Geotechnical Investigation for the Proposed Sludge Dam near Port St. Johns".
3. GIBB Africa, Parsons & Associates, May 1998,
   "The Roundhill Regional Solid Waste Disposal Site"

APPENDIX A

Map 1: Locality

Geotechnical Investigation - Krakeel River : MAP 1 - Locality